In the Figures:

Figures 3, 8A and 8B, as submitted were informal, and formal substitutes are included herewith for each of those figures.

Remarks

Several small typographical errors in the Specification were amended above. No new matter has been inserted into the corrected paragraphs.

Formal substitute copies of Figures 3, 8A and 8B are enclosed herewith. No new matter has been inserted into those figures.

Claims 1-8 of the instant application have been provisionally rejected on the grounds of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 10/674,106. Of claims 1-8, claims 1 and 8 are the only independent claims and will be discussed first.

Claim 1 has amended for clarification, however the scope of original claim 1 and amended claim 1 is substantially the same.

Amended claim 1 calls for:

> An apparatus for preheating a substrate having a surface in order to perform laser thermal annealing of the substrate with **an annealing radiation beam** that is not substantially absorbed by the substrate at room temperature, the apparatus comprising:
>
> a preheating radiation source adapted to emit preheating radiation that is substantially absorbed by the substrate at room temperature;
>
> a relay lens adapted to receive the preheating radiation from said preheating radiation source and form **a preheating radiation beam** that forms a first image at the substrate, wherein the first image is scanned over the substrate surface to preheat a portion of the surface that is in front of or that partially overlaps with a scanned second image formed by the annealing radiation beam; and

a recycling optical system arranged to receive preheating radiation reflected from the substrate and direct the reflected preheating radiation back to the substrate as **a recycled radiation beam.** (emphasis added)

From claim 1 in the instant application it can be seen that there are three pieces of apparatus, namely "preheating radiation source", "relay lens" and "recycling optical system" and that claim 1 discusses three beams, namely "annealing radiation beam", "preheating radiation beam" and "recycled radiation beam".

Of claims 1-17 of Application No. 10/674,106 only claim 1 is independent. Claim 1 of Application '106 has recently been amended to read as follows:

An apparatus for performing laser thermal annealing of a substrate having a surface, comprising:

a laser capable of generating continuous annealing radiation having a wavelength that is not substantially absorbed by the substrate at room temperature;

an **annealing optical system** adapted to receive the annealing radiation and form **an annealing radiation beam** that forms a first image at the substrate surface, and wherein the first image is scanned across the substrate surface; and

a **heating device** for heating at least a portion of the substrate to a critical temperature such that the annealing radiation beam incident upon said portion is substantially absorbed near the surface of the substrate at said portion during scanning;

wherein the **heating device includes**:

a **preheating radiation source** adapted to emit preheating radiation of a wavelength that is substantially absorbed by the substrate at room temperature; and

a relay system adapted to receive the preheating radiation from the preheating radiation source and form **a preheating radiation beam** that forms and scans a second image over the substrate surface to preheat a portion of the substrate that is in front of or that partially overlaps the scanned first image.

From amended claim 1 of Application '106 it can be seen that the apparatus only includes "a laser", "an annealing optical system" and "a heating device" with the "heating device" including "a preheating radiation source" and "a relay system". Claim 1 of Application '106 discusses only two beams, namely "annealing radiation beam" and "preheating radiation beam". There is no mention of a "recycling optical system" and a "recycled radiation beam" as called for in claim 1 of the instant application.

Thus claim 1 of the instant application is clearly different from claim 1 of the Application '106.

Additionally, from a search of the Application '106 as filed for words such as "redirected", "reflected", "recycled" and "returned" and other forms of those words, only the word "returning" could be found. In the three paragraphs of the Application '106 at page 21, lines 1-27 (which are the same three paragraphs of the instant application between page 21, line 23 - page 22, line 7), the dangers of preheating radiation 150 returning to the preheating radiation source is discussed.

For convenience, those paragraphs are reproduced here:

"With reference now to FIG. 10B, even if the incidence angle θ_{150} is chosen off-normal incidence so that reflected (specular) preheating radiation 150 cannot return to the preheating radiation source, scattered (or non-specular) preheating radiation 150S returning to preheating radiation source can present a problem. Even a small amount of radiation

returned to some types of preheating radiation sources (such as lasers) can cause operational instability. Also, it is desirable to employ p-polarized preheating radiation when operating off of normal incidence in order to increase the proportion of radiation that is absorbed in the substrate and to reduce the variation in absorption caused by the various structures on the substrate."

"Thus, in an example embodiment, the amount of preheating radiation 150S that returns to the preheating radiation source 142 is reduced by adding a polarizer 143P and a Faraday rotator 143F downstream of relay lens 143. The Faraday rotator 143F is located between the polarizer 143P and substrate 10. In operation, the Faraday rotator rotates the polarization of the preheating radiation beam 150 by 90° after two passes through the rotator, and the polarizer blocks the polarization-rotated preheating radiation 150S from returning to preheating radiation source 142. Operating optical relay system 140 such that preheating radiation beam 150 is off of normal incidence also facilitates measuring the power in reflected preheating radiation beam 150R, which is a useful diagnostic."

"Measurements of the power in incident preheating radiation beam 150 and reflected preheating radiation 150R can be used to calculate the power absorbed by the substrate 10. This is then used to estimate the maximum temperature produced by preheating radiation beam 150. By keeping the absorbed power in preheating radiation beam 150 above a certain minimum threshold, preheating sufficient to trigger strong absorption of the annealing radiation beam 20 by the substrate is assured."

There is no other mention of anything else being done with reflected portions of the preheating radiation beam other than it being prevented from reflecting back to the

source.

Since there is no showing or suggestion of the items in instant claim 1 noted above as not being in claim 1 of Application "106, or in the text of that application, claim 1 and all of the claims dependent from it, namely claims 2-7, cannot be obvious from any portion of Application '106. Therefore, instant claim 1 and claims 2-7 dependent therefrom cannot be held to be subject to a finding of nonstatutory obviousness double patenting.

Accordingly, it is submitted that claims 1-7 are in condition for allowance.

Instant claim 8, which is the second independent claim in examined claims 1-8 calls for:

> An apparatus for preheating a substrate having a surface in order to perform laser thermal annealing of the substrate with an annealing radiation beam that is not substantially absorbed by the substrate at room temperature, the apparatus comprising:
>
> **multiple preheating optical systems** each arranged to irradiate a portion of the substrate with **multiple preheating radiation beams** each having a wavelength that is substantially absorbed by the substrate at room temperature; and
>
> wherein said multiple preheating radiation beams form respective images that are maintained ahead of an annealing radiation beam image when the preheating radiation beams and the annealing radiation beam are scanned relative to the substrate surface.

Application '106 only discloses the use of a single preheating optical relay system 140 that generates a single preheating optical beam 150. From a complete scan of the Application '106 no mention or suggestion of the use of multiple systems 140 or the use

of multiple preheating radiation beams 150 could be found.

The present application being a CIP of Application '106, the discussion and figures in this the CIP is the same as in Application '016 through Figure 10B. The material added in the instant application, the CIP, begins with Figure 11 and continues through Figure 17, including the accompanying discussion of those added figures. The introduction of multiple preheating optical relay systems and multiple preheating optical beams does not occur until the discussion of Figure 17 at the bottom of page 25 of the instant application. Since Application '106 does not show or suggest the use of multiple preheating beams, claim 8 cannot be obvious from the Application '106 or any of the claims in that application.

Therefore claim 8 is patentably distinguishable from Application '106 and thus not subject to nonstatutory obvious double patenting.

All of claims 1-8 having being shown to not be obvious from Application '106, they are all in condition for allowance.

Favorable action is respectfully requested.

Respectfully submitted,
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